



R. P. Junghans, *Chimeric effectors cell receptors against carcinoembryonic antigen, 11/30/01.*

## Claims

What is claimed is:

1. A chimeric molecule comprised of the CEA binding domain of humanized antibody MN14 as a single chain antibody with a (GGSGS)3 linker, the zeta signaling chain of the T cell receptor and an intervening CD8 $\alpha$  hinge in which the cysteine residues have been mutated, with the sequence of Figure 3.
2. A molecule of claim 1 in which other signaling chains of T cells or other cell types are substituted, or in which a different hinge molecule or no hinge molecule is substituted, or a combination thereof.
3. A molecule of claim 1 or 2 in which at least one of the CDRs of the heavy chain of MN14 and one of the CDRs of the light chain of MN14 are preserved in a form (e.g., sFv or Fab) that maintains the binding of the CEA antigen, and/or in which the linker is of different composition.
4. A molecule of claim 1, 2 or 3 which has been modified in DNA or protein sequence but which retains the specificity and action of these molecules.
5. The use of molecules of claims 1, 2, 3 or 4 expressed in T cells or NK cells or other effector cells to treat patients with cancers expressing the CEA antigen.
6. The combination use of molecules of claims 1, 2, 3 or 4 expressed in T cells or NK cells or other effector cells to treat patients with cancers expressing the CEA antigen, together with each other or with heterologous constructs to engage additional stimulatory and functional properties of the effector cells to enhance the antitumor therapeutic efficacy.